

The Cary Arboretum



of The New York Botanical Garden

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Research Towards the Prediction of Gypsy Moth Damage

The gypsy moth.

How much damage will it cause in a given year?

Where do outbreaks occur? How long will an outbreak last?

How can we predict its cycles and feeding habits?

Uncovering answers to these questions is the basis of a one-year research project funded by the New York State Department of Environmental Conservation and supervised by Arboretum Scientist Dr. Clive Jones.

"Extensive research on the gypsy moth has not yet produced a means of accurately predicting when, where and how gypsy moth damage will occur," says Dr. Jones. "This is because past studies have not taken a holistic, ecological approach." This study, which began in November, 1981, is a pilot project to demonstrate the feasibility of predicting the gypsy moth by understanding the ecological relationships of the insect and its environment. Like other studies at the Arboretum, this project is based on knowing the ecology first, and from that knowledge, developing management techniques.

The field work in this project is being con-

ducted and supervised by Vassar College graduate Karen Budwill, Research Assistant. The site chosen for the research is the Tea House Hill, currently undergoing a gypsy moth outbreak. Work is being carried out on 20 ten-meter-diameter plots lying on North-South and East-West lines across the hill. Within these plots, vegetation has been identified, mapped and measured. A fish-eye lens system is being used to photograph tree canopies to record the defoliation and refoliation process, and frass, or larval excrement, will also be collected and weighed as another way of measuring the extent of this year's defoliation. Thousands of old (1981 hatch) and new (1982 hatch) egg masses were counted, tagged and measured during the winter months. "I hadn't anticipated the project would involve climbing trees and work on snow shoes," says Ms. Budwill. "But working through the winter has prepared us for the most active season of the gypsy moth."

In the laboratory, the number and size of egg masses, eggs per mass, egg parasitism and a number of other characteristics were recorded to relate to field data. During the early larval (wind blown) stage, larvae will be intercepted in traps to determine abundance. Later-stage larvae will also be counted, and will provide information on mortality due to disease, predators and parasites. Pupal



Karen Budwill, Photographer

A winter canopy as documented with a fish-eye lens. The darkened disk is used in some photographs to occlude the sun for even exposures.

size, sex ratios and pupal mortality will be recorded, as will characteristics of the 1983

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Future Displays Will Teach, Inspire

Two horticulture projects underway at the Arboretum are directed toward developing educational displays for home owners, garden club members and students.

Located near the Plant Science Building, the Rhododendron Dell was the focus of major construction during the summer of 1981 by the Arboretum's grounds crew and local high school students enrolled in the Y.C.C. program (Youth Conservation Corps). By late summer, the team of avid workers had constructed steps leading to the Dell, trails

through the three-acre area, an observation deck and a high viewing deck.

With phase one of the project successfully completed, the stage was set for planting to begin, and at the first signs of spring in early March, four members of the Arboretum's grounds crew traveled to the Target Rock National Wildlife Refuge (formerly the estate of the Eberstadt family) where 30- to 40-year-old rhododendrons and assorted ground covers were dug for the Cary collection. Through this generous donation by the Eber-

stadt family, over 40 rhododendrons became the first arrivals to the Dell this year, and in late March, the crew broke through still-frozen ground to plant a large grove of Carolina rhododendrons along with some of their hybrids.

As a result of this year's \$2,000 donation from the Garden Club of Orange and Dutchess Counties, numerous catawba rhododendron hybrids were purchased in April.

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Hyatt Report: "Protect the Stream's Environment"

Gypsy Moth Damage
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The Hyatt Report, the result of an in-depth investigation of the physical, chemical and biological conditions of the Arboretum's stream and its inhabitants, has been the focus of actions taken recently to protect and perpetuate the stream's population of brown trout.

As part of the Arboretum's fishery program, the stream study was initiated in 1979 to better understand existing resources. Bill Hyatt, then a graduate student at the University of Connecticut, concentrated his research on the Arboretum's portion of the east branch of the Wappingers Creek, where a population of native brown trout was studied. Results indicated that the population suffered from the drought conditions during the summers of 1980 and '81. During those years, natural competitors such as fall fish and suckers produced a crowding effect in shallow pools, and low water conditions raised water temperatures in the pools, creating less than optimum conditions for trout. As a result of these stresses on the brown trout population, new regulations for the 1982 fishing season were instated.

This season, trout less than nine inches in

length are being protected to insure future breeding populations in the stream. A prime spawning ground located between Fowler Road and the Arboretum's Fern Glen is also a special regulations area where fish less than 12 inches are being protected.

An advisory committee consisting of Arboretum administrators, members of the Arboretum's Wildlife Department, Fishing Friends (a group organized by Jay Van Alen in 1979), and selected individuals with a concern for the future of the fishing program, was organized this year. During the next several weeks, the committee will review the Hyatt Report and will weigh options that will help protect, preserve and improve the stream's environment. These options include the control of competing species of fish in the stream, stabilization of the stream bank, and continuation of the use of special regulations areas where mature fish are protected.

"We intend to proceed slowly and carefully," states Arboretum Wildlife Ecologist Jay McAninch. "To guarantee the future of our fishing program, we must protect and perpetuate our existing resources and populations."



PLEASE!

Don't collect plants, insects, wildlife or rocks on the Arboretum grounds!

Corporation Funds Dr. Karnosky

The Research Corporation, a philanthropic organization dedicated to the advancement of science and technology, has recently granted \$15,400 to the Cary Arboretum for continued work to hybridize the American elm.

Under the direction of Arboretum Forest Geneticist Dr. David Karnosky, tissue culture techniques have been used to successfully isolate and fuse protoplasts of the American elm with those of Asian elms. The goal of the project is to obtain a hybrid which will have the desirable ornamental and urban-hardiness traits of the American elm, and the disease resistance of the Asian elms.

The grant from the Research Corporation will further this effort by funding students from area colleges who will work under the supervision of Dr. Karnosky and Dawn Lange, M.S., a College of Environmental Science and Forestry doctoral candidate who has pursued this project since 1978. Techniques to culture protoplasts will be studied by the students over a two-year period, with a goal to regenerate whole plantlets from the protoplasts.

Support for this project has also come in the form of grants from the National Parks Service, the International Paper Company Foundation, and the Arthur Ross Foundation.

At the Garden

A display of spring perennials will be on exhibit through May 16 at the lovely Enid A. Haupt Conservatory in the Bronx.

On May 21, the annual outdoor Rose Show begins, featuring rose standards, floribundas and ramblers, and will include hydrangeas and tuberous begonias. This display can be seen through June 6.

The indoor summer show at the Garden begins June 11 and will include displays of caladiums, large-leaved spathiphyllum and other tropicals. Flowering summer flowers on display will include colorful arrangements of dahlias, gladioli, montbretias, caladiums, lilies, and begonias. The show will continue

through September 19.

The Enid A. Haupt Conservatory is open Tuesday through Sunday, 10 a.m. to 5 p.m. Members of the Arboretum are admitted free to the Conservatory, and Wednesday is "free day," when the general public is also admitted without charge. A cafe located in the Hanging Garden Room of the Conservatory is open for light lunches and snacks on Wednesdays and weekends, 11 a.m. to 4 p.m., and a snack bar/restaurant is operated every day in the Snuff Mill.

For more information on the New York Botanical Garden, contact Robin Parow-Place (914) 677-5343.

hatch egg masses. In this way, data from eggs over a three-year-period can be studied in one calendar year. In fall, the extensive data will be analyzed to establish relationships between the life cycles of the gypsy moth and its habitat.

Several students and volunteers are assisting Ms. Budwill and Dr. Jones. Volunteers include Renata Wynnyk, Larry Moore and Kurt Moore. Brenda Kilianski of Wheaton College, John Pavelock of Dutchess Community College and Bruce Hanka are also involved in the project.

A gypsy moth task force organized by the Dutchess County Cooperative Extension has prepared information on gypsy moth control for the homeowner. For information, call the Gypsy Moth Hot Line (914) 677-5035 or 635-2511.

Future Displays

Continued from page 1

These exceptionally hardy varieties were developed mainly by English breeders around the turn of the century using *Rhododendron catawbiense* from the Smoky Mountains as the principal parent. They produce six- to eight-inch flower trusses in shades of red, rose, pink, lavender and white. Of the thousands of rhododendrons available, these "iron clads," as they are now called, are the rhododendrons best suited for the climate of Dutchess County.

The goal of the Dell is to provide a mass display of the most dependable varieties of rhododendrons hardy to this area. This desire works jointly with the philosophy of the Garden Club of Orange and Dutchess Counties, which, as one of the 13 founding clubs of the Garden Club of America, engages in projects that will provide inspiration and learning experience to the public. The members of the garden club have agreed to fund the Dell's development through 1986, when a phased acquisition of several hundred more plants is anticipated. Choices of the species and cultivars to be displayed is being guided by a committee comprised of top rhododendron specialists in the northeast.

Also the result of generous contributions by local garden clubs, the Gifford Garden is in phase two of its three-year construction. Brick paths, a flight of stairs leading into the garden, and brick ramps to accommodate the handicapped will soon be completed, and during the summer, the brick wall of the sunken octagonal area will be set.

The garden, which will be planted during the summer of 1983, will be one of the most magnificent perennial displays in the northeast. Based on the book *Low Maintenance Perennials*, by Arboretum Horticulturist Robert Hebb, the garden will contain plants recommended for their long-lasting blooms and ease of care.

Funds from the Millbrook Garden Club, the Nine Partners Garden Club, the Natural Heritage Trust, the Mary Flagler Cary Charitable Trust, and donations from Arboretum members have helped support the construction of this garden.

Enter the Summer Slide Contest

"Spring Scenes"

Summer landscapes, flowers, architectural studies and Arboretum activities are among the subjects photographers will be looking for when the Arboretum's second annual summer photographic slide contest begins June 1.

A cash prize of \$50.00 will be awarded for the best set of ten 35mm color slides taken on the Arboretum grounds, as selected by an independent judge. Cash prizes of \$25.00 and \$15.00 will be awarded to second and third place entries, respectively. Slides must be dated between June 1 and September 15,

1982.

All entries become the property of the Cary Arboretum, and should be originals (not duplicates.) Contestants may obtain tax donation slips for non-winning entries if they wish. More than one group of slides may be submitted. Each should be carefully labeled as to subject, date and photographer.

A list of contest rules can be obtained through the Arboretum's Public Relations Office (914) 677-5343.

"Spring Scenes," an exhibition of color photographs by Arboretum volunteer Bernard Heyman, opens Sunday, May 9 with a gallery reception at the Plant Science Building from 1:30 to 4:00 p.m.

The exhibit includes spring scenes from the Greenland Icecap to the Anza Borrego Desert, and features a variety of plantlife as seen through the eyes of a nature lover and artist.

The exhibit, which will be on display through May 30, can be viewed weekdays, 8:30 a.m. to 4:30 p.m.

Library News

One way the Cary Arboretum library collection grows is through the donations of books and magazines. Over the past two years, the library has received over 200 volumes of books and journals. Arboretum librarian Mrs. Betsy Calvin wishes to thank the following donors for enriching the research and circulating collections:

Mr. I.O. Baitulin, U.S.S.R. — *Root Systems of Plants of Arid Zones of Kazakhstan*.
Mrs. McAllister-Loeb, Amenia — *Hortus Floridus*.
Mr. T.R. Dudley, Washington D.C. — *Novitates Systematicae Plantarum Vascularum, Volumes 8 and 9*.

Ms. Janet Adams, Millbrook — *Wildflowers, A Sampler of Wayside Herbs, Flower Arrangements to Copy, The Washington Star Garden Book*.

Mr. and Mrs. Francis Behnke, Stanfordville — Several books on ecology and botany.
Herbert C. Morse II, North Carolina — Several books published by Friends of the Earth.

Mrs. Paul Peabody, Millbrook — *Handbook of Trees of the Northern States and Canada, This Green World, The World Was My Garden, The Art of Japanese Gardens, Fabre's Book of Insects*.

Mrs. Brooks Wright, Nyack — Several books on gardens and ferns.

Mr. Dennis O'Leary, Poughkeepsie — Several books on gardening and agriculture.

Mr. Emil Keller, Millbrook — *Proceedings of the Royal Microscopy Society*.

Mr. and Mrs. Rhys Williams, Millbrook — Books on the Hudson River and Dutchess County history.

Mrs. Estelle Pomeroy, Millbrook — *Natural History, Smithsonian, and Living Wilderness* magazines.

Mr. and Mrs. Hugh Collins, Millbrook — *The Proteaceae of South Africa, Panorama* magazine.

People at the Arboretum



Robin Parow-Place, Photographer

John Bouton

John Bouton, Grounds Foreman . . . John Bouton's life changed in 1961 when Mary Flagler Cary contracted his employer, the Davey Tree Expert Company of Kent, Ohio, to work on her Millbrook property. Shortly thereafter, he and his family moved from Ohio to Dutchess County, and, still employed by the Davey Company, he was soon foreman on the Cary property and involved in all phases of arboriculture.

"Mrs. Cary was a tremendous lover of trees," John recalls, adding that her devotion to the environment kept him busy planting, pruning, cabling and fertilizing trees on the property until her death in 1968. One tree, a beautiful white pine seen from the teahouse overlook, was especially favored by her, and John's efforts to protect it with guide wires and a lightning cable are still noted by those who knew Mrs. Cary and her concern for this special specimen.

During an eight-year absence from the Cary estate, John continued his work as a tree surgeon and grounds consultant, and in 1973 accepted a position with the State of New York as a Tree Pruner Foreman. Looking back, he describes this period away from the Cary grounds as one which lacked the gratification and

peacefulness he found on the Cary property.

Perhaps this gratification was rediscovered in 1976 when John was hired as Grounds Foreman for the Cary Arboretum. "These grounds are sacred to me," he smiles, "and coming back made me very happy."

John oversees a crew of five, which he describes as "a group of good, hard working men." Working with this crew is rewarding all around," he says. "We respect each other and enjoy the variety of projects we do." John's speciality, however, is working with teenagers. During the past three years, he has taught underprivileged youths in County, State and Federal programs many marketable skills such as woodlot management and tree care. John is also a "teacher in residence" to New York Botanical Garden Horticulture students who come to the Arboretum to study arboriculture and tree care.

At home, John and his wife, Erma, have four sons ranging in age from nine to 21. He also has a one-year old grandson. "My hobbies have always been my work and family," says John, "and with four boys and their range of interests from cars to music, I can't help but be interested too."

Around the Arboretum

At a Glance

May 9

Gallery reception, "Spring Scenes" by Photographer Bernard Heyman. 1:30-4:00 p.m. at the Arboretum's Plant Science Building, Route 44A. Exhibit on display through May 30.

June 2

Trip to John Jay Homestead and Caramoor.

June 6

Gallery reception, "Moods, Moments, and Memories" by Elayne Seaman 1:30-4:00 p.m. at the Arboretum's Plant Science Building, Route 44A. Exhibit on display through July 31.

June 25

Trip to the Hammond Museum and Katonah Art Gallery.

June 26

Annual "Sketch Around" 10 a.m. to 3 p.m. on the Gifford House grounds.

Tours of the greenhouse complex and solar-heated Plant Science Building: by reservation Wednesdays and Sundays, 1:30-3:30 p.m. Call 677-5358 for details.

Cary Gift Shop

Hours: Tuesday through Friday, 11 a.m.-4:30 p.m.

Weekends: 1:30-4:30 p.m.

Text by
Robin Parow-Place

IBM Employees Take Note

As part of a matching grants program, the IBM Corporation will match its employees' cash gifts to the Arboretum two-for-one. Effective immediately, approved pledges will be doubled by IBM's Corporate Support Program in Armonk, New York.

According to a spokesperson for IBM, matching grants are an important part of IBM's overall corporate contributions program. The company is pleased to join with its employees to support institutions by matching their gifts in this generous way.

Annual Reports Available

Triennial reports of the New York Botanical Garden and the Cary Arboretum (years 1979-1981) can be obtained by contacting Mrs. Janice Claiborne, (914) 677-5343.

Dr. Jones Receives Grant for Insect Study

The relationship between lubber grasshoppers and the chemical defenses of the plants it consumes is the focus of a study funded recently by the National Science Foundation.

The grant, in the amount of \$197,000 over three years, will fund collaborative research by Arboretum Chemical Ecologist Dr. Clive Jones and Dr. Murray Blum, a professor of the Department of Entomology of the University of Georgia. Under investigation will be two species of lubber grasshoppers indigenous to two separate areas of the United States. They are related to economically important pests such as locusts.

The lubbers are distinguished by the production of chemical defense secretions whose compositions appear to be influenced by the plants they consume. These defenses are used against predators such as birds and small mammals. "These insects feed on a wide variety of herbaceous plants and therefore have the potential to store a wide assortment of chemicals in their systems," reports Dr. Jones. "By knowing the plant foraging habits and the chemical composition of grasshopper secretions, we can investigate the relationship between diet and defense."

These chemical ecology studies will provide valuable information on the evolution of

plant-feeding insects to exploit plants, the influence of plant defenses on this process, and the adaptations of insects to use these defenses against predators.

In addition, the production of sex attractants in defense secretions will be studied in order to understand how sexual behavior may be regulated by secretions that also function to repel predators.

The studies may produce information of considerable importance in the development of pest control strategies for major insect pests, such as locusts.

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of
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